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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HUFFMAN, JULIAN D

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/553,258	<b>Applicant(s)</b> NAKATA ET AL.	
	<b>Examiner</b> Julian D. Huffman	<b>Art Unit</b> 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 31-38 and 40-45 is/are pending in the application.
- 4a) Of the above claim(s) 38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31-37 and 40-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

Claim 38 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species/invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 11 March 2009.

### ***Claim Objections***

Claim 33 is objected to because of the following informalities:

In claim 33, line 3, "where" should be inserted after "position".

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 31-37, 40-43 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimura.**

Sugimura discloses:

With regards to claim 31, an image forming apparatus (fig. 8) comprising:

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a carriage (203) having a recording head (101) that ejects droplets of liquid onto a recording medium for forming an image on the recording medium; and

a state detector (20) that detects presence of the recording medium along a moving line of said carriage,

wherein when moving said carriage in a main-scanning direction to perform a printing operation, a part of the printing operation is cancelled after said state detector detects non-presence of the recording medium [0012], and

wherein said state detector is provided on an upstream side of said carriage in a feed direction of the recording medium (fig. 8, element 20 is on an upstream side of the carriage), and the printing operation is started in a subsequent main scanning after said recording medium is conveyed and state detector detects an edge of the recording medium while scanning said carriage in the main-scanning direction in a current main-scanning, and a controller receives detection information from said state detector when said state detector detects the edge of the recording medium in the main scanning direction for a main-scanning of said carriage, and the controller determines therefrom a position of the edge of the recording medium used in the printing operation of a subsequent line (fig. 8, [0026], [0027], [0067]).

With regards to claims 32 and 33, the image forming apparatus as claimed in claim 31, wherein said state detector is provided on an upstream side of said carriage in the main-scanning direction so as to cancel the part of the printing operation in the main-scanning direction after a position where non-presence of the recording

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medium is detected by said state detector in an initial scanning of said carriage for printing (fig. 8).

With regards to claim 34, the image forming apparatus as claimed in claim 31, wherein a plurality of heads are provided in the recording head so as to eject droplets in a plurality of colors by being arranged in the main-scanning direction, and the main-scanning of said carriage is continued after non-presence of the recording medium is detected by said state detector so as to cancel a printing operation of each of the heads step-by-step while moving the carriage in the main-scanning direction (figs. 3, 4, 8, [0034], [0050], **[0067]**).

With regards to claim 35, the image forming apparatus as claimed in claim 34, wherein an amount of movement of said carriage in the main-scanning direction and cancellation of the printing operations of the heads step-by-step are controlled, after the non-presence of the recording paper is detected, in accordance with information regarding an adjustment value of intervals between the heads (dn, [0067]).

With regards to claim 36, the image forming apparatus as claimed in claim 31, wherein a plurality of nozzle trains are provided in the recording head so as to eject droplets in a plurality of colors by being arranged in the main-scanning direction, and the main-scanning of said carriage is continued after non-presence of the recording medium is detected by said state detector so as to cancel a printing operation of each of the nozzle trains step-by-step while moving the carriage in the main-scanning direction (fig. 8, [0067]).

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With regards to claim 45, the state detector is provided on the upstream side of the carriage in the paper feed direction (fig. 8) to monitor a width of a printing line subsequent to the current printing line, so that the subsequent printing operation is performed based on the width determined in the previous printing operation ([0026] [0027]).

With regards to claim 40, (the image forming apparatus as claimed in claim 39), wherein a plurality of heads are provided in the recording head so as to eject droplets in a plurality of colors by being arranged in the main-scanning direction, and the main-scanning of said carriage is continued beyond the edge of the recording medium detected by said state detector so as to cancel the printing operation of the heads step-by-step (fig. 8, [0067]).

With regards to claim 41, (the image forming apparatus as claimed in claim 40), wherein an amount of movement of said carriage in the main-scanning direction and cancellation of the printing operations of the heads step-by-step are controlled, after each of said heads passes the edge of the recording medium, in accordance with information regarding an adjustment value of intervals between the heads (dn, fig. 8, [0067]).

With regards to claim 42, (the image forming apparatus as claimed in claim 39), wherein a plurality of nozzle trains are provided in the recording head so as to eject droplets in a plurality of colors by being arranged in the main-scanning direction, and the main-scanning of said carriage is continued beyond the edge of the recording medium detected by said state detector so as to cancel the printing operation

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of the nozzle trains step-by-step (fig. 8, [0067]).

With regards to claim 43, the image forming apparatus as claimed in claim 39, wherein said state detector is provided at a position corresponding to the nozzle train closest to an edge off said recording head in the main-scanning direction (fig. 8).

With regards to claims 31, 33 and 39, Sugimura discloses everything claimed with the exception of detecting the recording medium for each main-scanning. Sugimura states that the detection is performed "for every several scans" [0064].

However, it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Sugimura so as to perform the detection for each scan for the purpose of more accurately detecting the skew of the print medium [0021].

With regards to claim 37, Sugimura does not disclose bidirectional printing and when a part of the printing operation in one direction is cancelled, a part of the printing operation corresponding to an area where the printing operation is cancelled in the one direction is also cancelled in the printing operation in the other direction.

However the examiner takes official notice that bi-directional printing is well known in the art.

It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate bidirectional printing in Sugimura and to control the device such that when a part of the printing operation in one direction is cancelled, a part of the printing operation corresponding to an area where the printing operation is cancelled in one direction is also cancelled in the printing direction in the other direction so as to improve the printing speed while preventing ink from staining the printing device.

One of ordinary skill in the art, in incorporating bidirectional printing into Sugimura, would have utilized the detection results to control printing in both directions by simple modifications so as to continue to realize the benefits of Sugimura with the added benefit of bidirectional printing.

**Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugimura in view of Maki et al. (U.S. 20020126193).**

With regards to claim 44, Sugimura does not disclose an electrostatic conveyance belt conveying the printing medium.

However, Maki et al. discloses an electrostatic conveyance belt (abstract).

It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate an electrostatic belt feeder into Sugimura for the purpose of more stably conveying the printing medium.

### ***Response to Arguments***

Applicant's arguments filed 14 July 2010 have been fully considered but they are not persuasive.

The examiner disagrees with the applicant's characterization of Sugimura. Sugimura fails to support or disclose the control of the printing operation summarized by the applicant which begins on page 10 of the response.

Respectfully, one of ordinary skill in the art would not have interpreted Sugimura in the manner set forth by applicant.



Sugimura describes the instance when "the record paper P is conveyed and the record paper P is detected by the sensor 20" [0067].

As shown in fig. 8, the feeding direction is represented by the downwards pointing arrow. The point at which the paper is detected after it is conveyed occurs when the leading edge, pointed to by element P, is coincident with the sensor 20 (more specifically between elements 21 and 22). Sugimura fails to disclose any further feeding of the paper between the disclosed operation of conveying until detection, and in consideration of the time lag, feeding and printing by the heads. It is not possible for the recording paper to be fed in the upstream or backwards direction prior to printing without feeding the printing position past the printing heads 101. If the paper is fed in the upstream direction (direction opposite from arrow of fig. 8) after it is conveyed to the point where it is detected (where the edge P is beneath sensor 20), then none of the nozzles will be positioned over the printing paper during a subsequent print operation. Therefore, since Sugimura fails to disclose step iii set forth by the applicant, the retreating of the record paper P is a feeding operation in the downstream direction to place the position of the edge sensed by the sensor 20 over the recording heads by feeding in the amount d2. Additionally, there is no reason to feed the paper past the printing heads and then reverse feed the paper to be aligned with the printing heads. Therefore one of ordinary skill in the art would not interpret Sugimura in the manner set forth by the applicant. Rather, Sugimura must operate in the manner described in the response to arguments in the prior rejection.

For the above reasons, the rejection must be maintained.

***Conclusion***

**THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian D. Huffman whose telephone number is (571) 272-2147. The examiner can normally be reached on 10:00a.m.-6:30p.m. Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Julian D. Huffman/  
Primary Examiner, Art Unit 2853